A.9 California Clapper Rail (*Rallus longirostris obsoletus*)

A.9.1 Legal Status

The California clapper rail (*Rallus longirostris obsoletus*) is state and federally listed as endangered. The species was listed by the California Fish and Game Commission pursuant to the California Endangered Species Act (Fish and Game Code, Sections 2050 et seq.) on June 27, 1971, and by the U.S. Fish and Wildlife Service (USFWS) pursuant to the federal Endangered Species Act on October 13, 1970 (35 FR 16047).

Critical habitat has not been designated for this species.

A.9.2 Species Distribution and Status

Range and Status

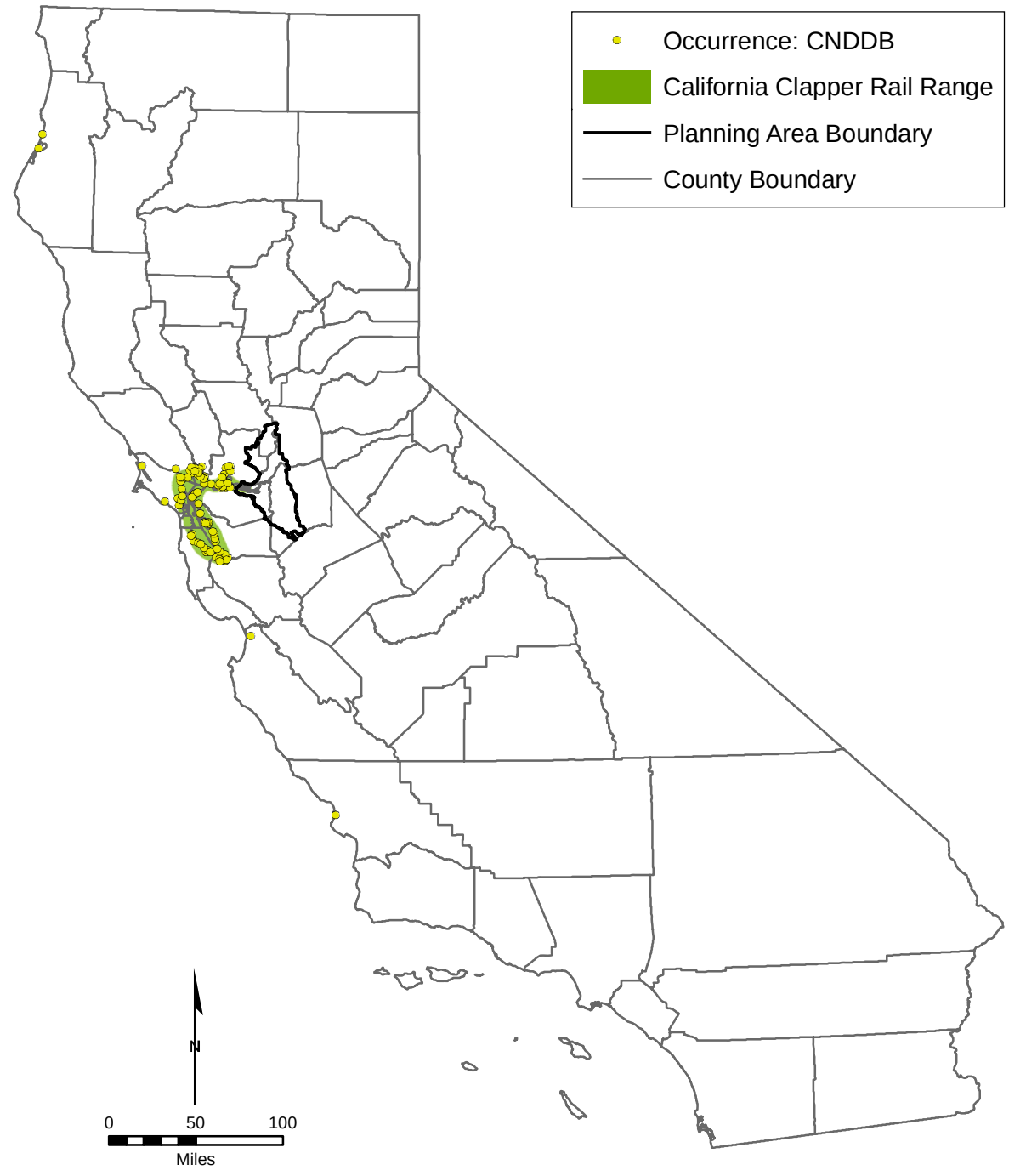
The California clapper rail is one of three subspecies of clapper rail (other species: light-footed clapper rail, *R.l. levipes* and Yuma clapper rail, *R.l. yumanensis*) listed as endangered under both state and federal Endangered Species Acts.

The historical range of the California clapper rail extended within the coastal California tidal marshes from Humboldt Bay southward to Elkhorn Slough and Morro Bay, and estuarine marshes of San Francisco Bay and San Pablo Bay to the Carquinez Straight. Historically, the highest densities of California clapper rails existed in south San Francisco Bay (USFWS 1998, DWR 2001, LSA 2007).

The current distribution is limited to San Francisco Bay, San Pablo Bay, Suisun Bay, and tidal marshes associated with estuarine sloughs draining into these bays (Figure A.9.1) (DWR 2001). The USFWS reports that there are populations in all of the larger tidal marshes in south San Francisco Bay, and the distribution in the North Bay is patchy and discontinuous, primarily in small, isolated habitat fragments (USFWS 1998). Small populations are widely distributed throughout San Pablo Bay and at various locations throughout the Suisun Marsh Area (Carquinez Strait to Browns Island, including tidal marshes adjacent to Suisun, Honker, and Grizzly Bays) (USFWS 1998).

California clapper rail populations were historically abundant in the San Francisco Bay estuary until sport and market hunting seriously depleted numbers in the late nineteenth and early twentieth centuries. In 1913, clapper rail hunting was prohibited with passage of the Migratory Bird Treaty Act, resulting in population recoveries that at times reached their former abundance. However, the increasing destruction of tidal marshes for salt ponds, agricultural land, and bayfill reduced and fragmented available habitat and this trend quickly eroded. Of the 193,800 acres of tidal marsh that bordered San Francisco Bay in 1850, about 30,100 acres currently remain (Dedrick 1989). This represents an 84 percent reduction of available habitat from historical conditions (DWR 2001).

In the early 1970s, California clapper rail populations were estimated at 4,200 to 6,000 individuals (Gill 1979). With continuing loss and fragmentation of habitat, the total rail population reached an estimated all-time historical low of about 500 birds in 1991, with about 300 rails in south San Francisco Bay (USFWS, unpubl. data; E. Harding-Smith, pers. comm. as



Source: California Department of Fish and Game, WHR, 2006.
California Department of Fish and Game, CNDDB, 2008.
Estep, 2008.

Figure A.9.1. California Clapper Rail Statewide Range and Recorded Occurrences

cited in DWR 2001). In response to predator management, the south San Francisco Bay rail population has since rebounded from this lowest population estimate and is currently estimated to be approximately 500 to 600 individuals (USFWS unpubl. data; J. Albertson, pers. comm. as cited in DWR 2001), while a conservative estimate of the north San Francisco Bay population, including Suisun Bay, is 195 to 282 pairs (Evens et al. 1994 as cited in DWR 2001).

Distribution and Status in the Planning Area

There are no reported occurrences of California clapper rail within the BDCP Planning Area (Figure A.9.2). The nearest reported occurrences west of the BDCP Planning Area are in the vicinity of Suisun Marsh. Isolated patches of suitable habitat may occur within the BDCP Planning Area as far east as the western edge of Sherman Island. The following from DWR (2001) describes the history of occurrences in the Suisun Marsh area.

Harvey (1980) reported the first California clapper rail in the Suisun Marsh at Cutoff Slough in 1978, which extended their range east of the San Francisco Bay area. A coordinated clapper rail survey was conducted by the San Francisco Bay Bird Observatory throughout the estuary between 1983 and 1986, resulting in two detections at the upper end of First Mallard Branch (San Francisco Bay Bird Observatory 1987 as cited in DWR 2001). Additional detections were made in 1986 at the Concord Naval Weapons Station (O'Neil 1988 as cited in DWR 2001). Subsequent surveys conducted by DFG and DWR confirmed presence of the species in several locations in the Suisun Marsh including: Hill Slough, Cutoff Slough, First and Second Mallard branches, Suisun Slough from Goodyear Slough to Suisun Bay, Suisun Bay shoreline at the Suisun Marsh Reserve Fleet, Ryer Island, Point Edith Marsh, mouth of Boynton Slough, Union Creek, McCoy Creek and Suisun Slough at Morrow Island (DWR 2001).

A.9.3 Habitat Requirements and Special Conditions

Throughout their distribution, California clapper rails occur within a range of salt and brackish marshes. In south and central San Francisco Bay and along the perimeter of San Pablo Bay, rails typically inhabit salt marshes dominated by pickleweed (*Salicornia virginica*) and Pacific cordgrass (*Spartina foliosa*). Pacific cordgrass dominates the middle marsh zone throughout the south and central Bay (USFWS 1998).

In the North Bay (Petaluma Marsh, Napa-Sonoma Marshes, Suisun Marsh), clapper rails also live in tidal brackish marshes that vary significantly in vegetation structure and composition. Use of brackish marshes by clapper rails is largely restricted to major sloughs and rivers of San Pablo Bay and Suisun Marsh, and along Coyote Creek in south San Francisco Bay. Clapper rails have rarely been recorded in nontidal marsh areas (USFWS 1998).

DWR (2001) describes clapper rail habitat associations according to four features: 1) marshes supporting an extensive system of tidal sloughs that provide direct tidal circulation throughout the site; 2) predominant pickleweed coverage with extensive stands of Pacific cordgrass at lower marsh elevations; 3) high marsh cover consisting of tall stands of pickleweed, gumplant, and wrack; and 4) abundant invertebrate populations.

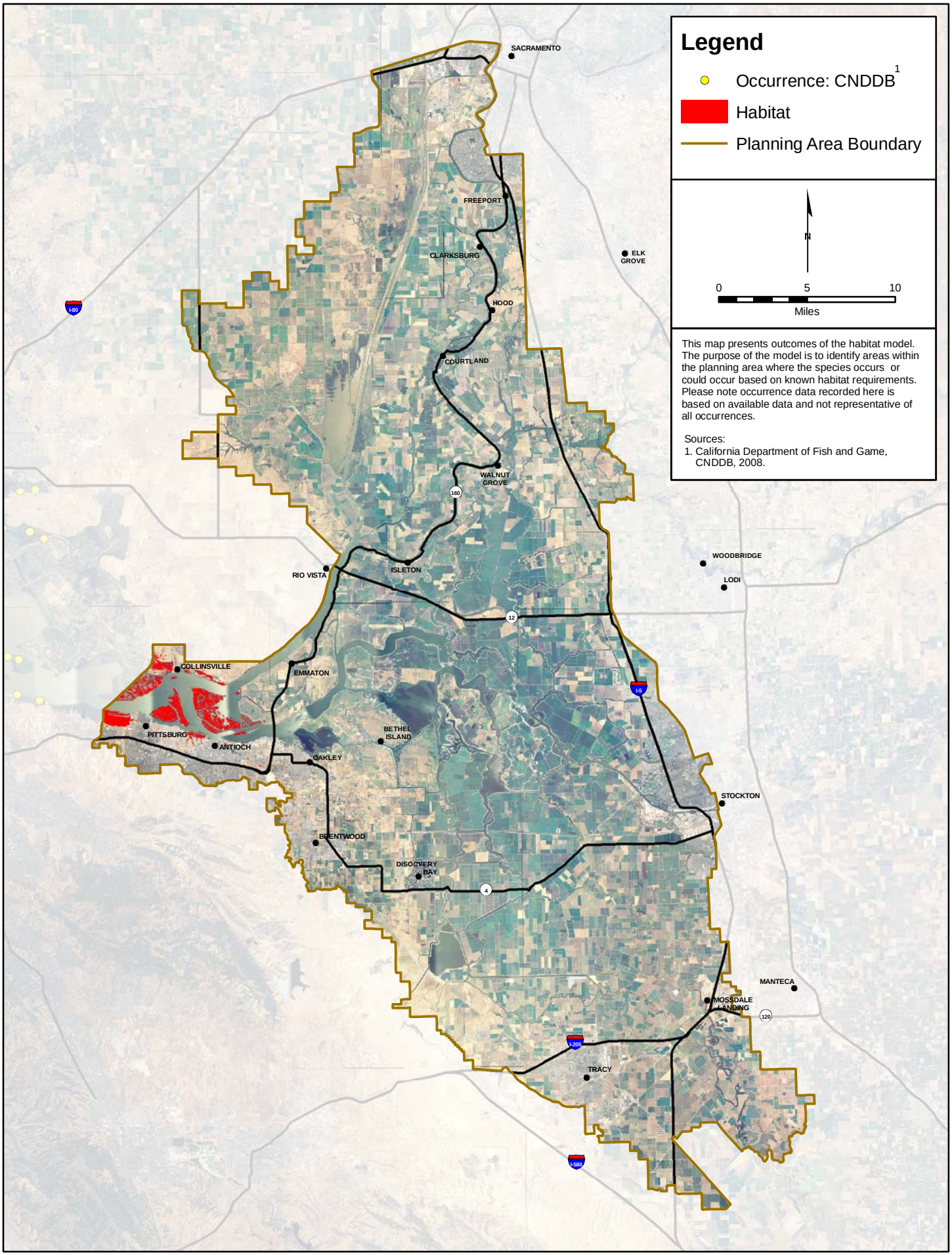


Figure A.9.2. California Clapper Rail Habitat Model and Recorded Occurrences

Population density is higher in habitats that exceed 100 hectares (247 acres) in size. Other factors that affect density include proximity of suitable marsh habitats to each other, buffer areas between marsh and upland areas, marsh elevation, and hydrology (LSA 2007). Rail densities have shown to be lower in more brackish habitats brought forth by freshwater outflows, possibly due to the resulting change in vegetation (Evens and Collins 1992 as cited in DWR 2001).

Nesting. In saline emergent wetlands, California clapper rails nest mostly in lower zones near tidal sloughs and where cordgrass (*Spartina foliosa*) is abundant (Harvey 1980, Zembal and Massey 1983, Eddleman and Conway 1998). Clapper rails build a platform concealed by a canopy of woven cordgrass stems or pickleweed and gumweed (Harvey 1980). Nests are constructed only as high as necessary to prevent inundation while preserving a natural cover of vegetation. Clapper rail nests are described as a mass or heap of vegetation, deeply cupped and securely woven to the surrounding vegetation that allows for flotation during extreme tidal events. Zucca (1954) discovered that although the nests are somewhat buoyant, they do not remain intact through a series of high tides. Clapper rails also use dead drift vegetation as a platform (Harvey 1990). The vegetation used to construct clapper rail nests is partly determined by the time of the nesting and the tidal influence (Zucca 1954). In fresh or brackish water, clapper rails construct nests in dense cattail or bulrush (Harvey 1980, LSA 2007).

Foraging. California clapper rails forage in higher marsh vegetation, along the vegetation and mudflat interface, and along tidal creeks.

A.9.4 Life History

Description. The clapper rail is a coot-sized bird that is generally gray-brown above and buffy-cinnamon below with brownish-gray cheeks and black-and-white barred flanks. It has a short neck, slightly down-curved bill, and a short tail cocked upward, revealing a white patch. Overall length ranges from 33 to 48 cm, and bill length greater than 5 cm (Lewis and Garrison 1983). The sexes differ only in size with males slightly larger than females. Juveniles have a paler bill and darker plumage, with a gray body, black flanks and sides, and indistinct light streaking on flanks and undertail coverts. California clapper rail is larger and of grayer plumage than *R.l. levipes* and *R.l. yumanensis*. Clapper rails are secretive, elusive, and difficult to observe in dense vegetation. Census data are usually taken by listening for vocal responses to recorded calls. When evading discovery, they typically freeze, hide in small sloughs or under overhangs, or run rapidly through vegetation or along slough bottoms. They prefer to walk or run over rather than fly, and generally walk upright. When flushed, they normally fly only a short distance before landing. They can swim well, although swimming is only used to cross sloughs or escape immediate threats at high tide (USFWS 1998, DWR 2001, LSA 2007).

Seasonal Patterns. The California clapper rail is apparently non-migratory; however, some seasonal movements occur probably in response to seasonal hydrological changes and its affect on habitat availability and quality (Rozengurt et al. 1987, Evens and Collins 1992). Post-breeding dispersal has also been recorded in late fall and early winter (Orr 1939, Wilber and Tomlinson 1976, Harvey unpubl. data as cited in LSA 2007). In general, these findings indicate that while clapper rails tend to be more dispersed within the marsh following the nesting season, in general they appear to move very little between seasons and between nesting or core-use territories (Albertson 1995 as cited in LSA 2007).

Reproduction. The nesting season for California clapper rails begins mid-March and extends into August with peaks observed in early May and late June (Gill 1973, Harvey 1980). Clutch

range is 6 to 10 eggs (Wilbur and Tomlinson 1976). Both the male and female incubate the eggs for approximately 18 to 29 days. Harvey (1980) reports hatching success of approximately 38 percent in the San Francisco Bay area.

Foraging Behavior and Diet. Clapper rails are most active in early morning and late evening, when they forage in marsh vegetation in and along creeks and mudflat edges. Most feeding is surface-gleaning and probing (Zembal and Fancher 1988). Most feeding occurs by walking a few steps, thrusting their beaks into the mud up to eye level, then walking a few more steps, then repeating the probing (Wilbur and Tomlinson 1976). Less frequent foraging behaviors include surface gleaning, fishing, and scavenging.

Moffitt (1941) examined the diet of California clapper rail by volumetric content of rail stomachs with the following results: ribbed horse mussels (56.5 percent), spiders (Lycosidae, 15 percent), seeds and hulls of cordgrass (14.6 percent); little macoma clam (*Macoma balthica*, 7.6 percent); mud crabs (3.2 percent); worn-out nassa (*llyanassa obsoletus*, 2 percent); and insects, clam worms (*Nereis* spp.), and carrion (1.1 percent) (Eddleman and Conway 1998). Overall, the content included over 85 percent animal matter and 14.6 percent vegetable matter.

A.9.5 Threats and Stressors

Habitat Degradation. Degradation of tidal marsh habitats continues to be the most significant threat to California clapper rail. Tidal marshes have been reduced by 84 percent since historical times (Dedrick 1989). While the loss of tidal marsh habitat through filling and diking has largely been curtailed, other current factors associated with declining populations include the conversion of salt marshes to brackish marshes due to freshwater discharges from sewage treatment plants, a progressive rise in sea level, invasion of runoff, industrial discharges, and sewage effluent (Williams 1985, Ohlendorf et al. 1989, Harvey 1990, Lonzarich et al. 1990, Foerster and Takekawa 1991, Leipsic-Baron 1992, Ohlendorf and Fleming 1988, DFG 2000 as cited in LSA 2007).

The suitability of many marshes for clapper rails is further limited, and in some cases precluded, by their small size, fragmentation, and lack of tidal channel systems and other micro-habitat features. These limitations render much of the remaining tidal marsh acreage unsuitable or of low value for the species. In addition, tidal amplitudes are much greater in south San Francisco Bay than in San Pablo or Suisun Bays (Atwater et al. 1979). Consequently, many tidal marshes are completely submerged during high tides and lack sufficient escape habitat, likely resulting in nesting failures and high rates of predation. The reductions in carrying capacity in existing marshes necessitate the restoration of larger tracts of habitat throughout the current range of the species to maintain stable populations (DWR 2001)

Predation. California clapper rails are subject to heavy predation from nonnative species such as red fox, feral cat (*Felis domesticus*) and Norway rat (*Rattus norvegicus*) as well as various native mammals and raptors (Foerster et al. 1990, Albertson 1995 as cited in LSA 2007, USFWS 1998, DFG 2000). The fragmentation of habitat through the construction of dikes and levees has increased and facilitated predation of clapper rails because terrestrial predators use these features as corridors to access clapper rail habitat (Foerster et al. 1990, Burkett and Lewis 1992). Urban development adjacent to marshland habitat has also increased predation by native predators such as raccoons, which thrive in urban areas, and raptors, which use electric power transmission lines as hunting perches (USFWS 1998). While red foxes, the predator that may pose the most serious threat to California clapper rails, have not yet been detected in the Suisun marsh; however, river

otters (*Lutra canadensis*) are common in the Suisun Marsh area and could also prey on eggs of clapper rails (Albertson and Evens 2000, LSA 2007).

A.9.6 Relevant Conservation Efforts

The Suisun Marsh has been the subject of various conservation efforts for many years, particularly with respect to development and water quality-related issues within its boundaries. The following from the DWR Suisun Marsh Program (http://www.iep.water.ca.gov/suisun/program/index.html) summarizes the major agreements, management plans, and legislation that have directed management of the Suisun Marsh since the mid-1970s. These efforts focus on the preservation and restoration of tidal marsh habitats.

The Nejedly-Bagley-Z'Berg Suisun Marsh Preservation Act (1974). The California Legislature enacted the Suisun Marsh Preservation Act that protects the marsh from urban development. It required the San Francisco Bay Conservation and Development Commission (BCDC) to develop a plan for the Marsh and provides for various restrictions on development within Marsh boundaries.

Suisun Marsh Protection Plan (1976). This plan was developed by the BCDC and defines and limits development within primary and secondary management areas for the "future of the wildlife values of the area as threatened by potential residential, commercial and industrial development." The Plan recommends that the State purchase 1,800 acres, and maintain water quality. While the focus of the Plan is on maintaining waterfowl habitat, the Plan also addresses the importance of tidal wetlands and recommends restoring historical marsh areas to wetland status (managed or tidal).

The Suisun Marsh Protection Act (1977). This bill adopts and calls for implementation of the Suisun Marsh Protection Plan. AB 1717 designates the BCDC as the state agency with regulatory jurisdiction of the Marsh and calls for the Suisun Resource Conservation District to have responsibility for water management in the Marsh. The bill identifies (and focuses on) actions for the preservation of waterfowl needs along with the retention of the diversity of wildlife. The Act states that land within the Suisun Marsh should be acquired for public use or resource management if it is suitable for restoration to tidal or managed marsh, but that such restoration cannot be required as a condition of private development.

SWRCB Water Rights Decision 1485 (1978). SWRCB adopted the Water Quality Control Plan for the Sacramento San Joaquin Delta and issued Water Rights Decision 1485. The Decision includes: channel water salinity standards from October to May and preserves the area as brackish water tidal marsh. Set water quality standards in the Marsh as a condition of export pumping and were based on DFG's recommendations, which were based on 1) the relative value of marsh plants as duck food; 2) the influence of soil salinity and other factors on distribution and growth of marsh plants; and 3) the relationships between channel water salinity and soil salinity. DFG concluded that improved management practices, improved drainage, water control facilities, and adequate quality of water were needed to achieve desired soil salinity conditions for waterfowl food plants.

Plan of Protection for the Suisun Marsh (1984). DWR and the U.S. Bureau of Reclamation (USBR) developed and began implementing the Plan of Protection (POP) in accordance with D-1485. The POP implementation strategy was to construct large facilities and distribution systems to meet salinity standards (lower channel water salinity), in lieu of significant Central Valley Project/State Water Project storage releases estimated as high as 2 million acre-feet in

dry/critical water years. The six-phase Plan of Protection was the programmatic blue print (required by the SWRCB and embodied in the original Suisun Marsh Preservation Agreement). Two of the six phases were completed including the Initial Facilities and the Suisun Marsh Salinity Control Gates.

Suisun Marsh Preservation Agreement (1987). This contractual agreement between DWR, USBR, DFG and SRCD contains provisions for DWR and USBR to mitigate the effects on Suisun Marsh channel water salinity from the State Water Project and Central Valley Project operations and other upstream diversions. The Suisun Marsh Preservation Agreement requires DWR and USBR to meet salinity standards, sets a timeline for implementing the Plan of Protection, and delineates monitoring and mitigation requirements. The Suisun Marsh Monitoring Agreement and the Suisun Marsh Mitigation Agreement were also signed at this time. The Suisun Marsh Mitigation Agreement defined habitat requirements to mitigate effects of facilities and operations and the Suisun Marsh Monitoring Agreement defines requirements for monitoring salinity and species in the Marsh.

Bay-Delta Accord (1994). On December 15, 1994, state and federal agencies, working with agricultural, environmental and urban stakeholders, reached agreement on water quality standards and related provisions that would remain in effect for three years. This agreement, known as the Bay-Delta Accord, was based on a proposal developed by the stakeholders. Elements of the agreement include:

- Springtime export limits expressed as a percentage of Delta inflow.
- Regulation of the salinity gradient in the estuary so that a salt concentration of two parts per thousand (X_2) is positioned where it may be more beneficial to aquatic life.
- Specified springtime flows on the lower San Joaquin River to benefit Chinook salmon.
- Intermittent closure of the Delta Cross Channel gates to reduce entrainment of fish into the Delta.

SWRCB Water Quality Control Plan (1995-1998). In 1994, wildlife and fishery agencies and urban water users expressed concerns about the appropriateness of western Suisun Marsh channel water salinity standards. The SWRCB, in the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, May 1995, modified the Suisun Marsh salinity objectives. Modeling analysis by the Suisun Marsh Planning Program showed that Suisun Marsh standards would be met most of the time at all Suisun Marsh compliance stations. Some standard exceedances would be expected in the Western Marsh that participants to the SMPA agreed could be mitigated by more active water control by landowners.

SWRCB Water Rights Decision 1641 (1999). The SWRCB issued Decision 1641 in December 1999, which updated salinity standards for Suisun Marsh. Increased outflow and salinity requirements for the Bay-Delta provided indirect benefits to the Suisun Marsh. DWR proposed that the SWRCB adopt the Amendment Three actions for Suisun Marsh in this Decision. The SWRCB was unable to adopt Amendment Three actions because the Section 7 consultation with the USFWS had not concluded. However, the SWRCB did relieve USBR and DWR of its responsibility in meeting salinity objectives at S-35 and S-97 in the western Marsh.

Suisun Marsh Charter Implementation Plan (2001). The Suisun Marsh Charter was completed in 2001 and commenced development of an Implementation Plan. Charter participants collaborated on a joint presentation to the State of the Estuary Conference on the principles of the Charter Plan including coordinated water quality, endangered species, and heritage value protection in the Suisun Marsh.

Habitat Management, Preservation, and Restoration Plan (2003). The expansion of the Charter process to include additional federal and state agencies to develop a Suisun Marsh Plan that will balance the goals and objectives of the Bay-Delta Program, Suisun Marsh Preservation Agreement (SMPA), and other management and restoration programs within the Suisun Marsh in a manner that is responsive to the concerns of all stakeholders and is based upon voluntary participation by private landowners.

In addition, several facilities have been constructed in the Suisun Marsh to protect and improve water quality and protect and enhance wildlife habitat including:

- Roaring River Distribution System (1979-80)
- Morrow Island Distribution System (1979-80)
- Goodyear Slough Outfall (1979-80)
- Suisun Marsh Salinity Control Gates (1988)
- Cygnus and Lower Joyce Facilities (1991)

Several tidal marsh restoration projects are also planned or being implemented within the range of the California clapper rail. These projects, implemented through the direction or support of the San Francisco Bay National Wildlife Refuge, National Biological Service, East Bay Regional Park District, Regional Water Quality Control Board, DFG, and the City of San Jose include the following:

- Restoration of the 1,500 acre Napa Marsh Unit in the Napa River in the north bay;
- Restoration of the Knapp Property, a 452-acre former salt pond in the Alviso area, on the edge of the bay, between Alviso and Guadalupe Sloughs.
- Enhancement of the 325-acre Oro Loma Marsh, an area of diked salt marsh and adjacent uplands located along the shore of Hayward. The area will be restored to tidal marsh and seasonal wetland habitat.
- Restoration of the Baumberg Tract, a 835-acre inactive salt evaporator in Hayward to tidal marsh and seasonal wetlands.
- Restoration of the Moseley Tract located just north of the west approach to the Dumbarton Bridge) from the Port of Oakland.

A.9.7 Species Habitat Suitability Model

Habitat. California clapper rail habitat includes all *Salicornia*-dominated natural seasonal wetlands and *Scirpus/Tyhpa*-dominated tidal freshwater emergent wetlands located west of State Highway 160 on Sherman Island. Vegetation types designated as species habitat in this model correspond to the mapped vegetation associations in the BDCP GIS vegetation data layer.

Assumptions. Historical and current records of this species indicate that its known distribution extends eastward in the Suisun Marsh (Figure A.9.2). While there are no occurrences from within the BDCP Planning Area, patches of suitable habitat extends into the BDCP Planning Area in the vicinity of Collinsville and Antioch. For purposes of this model, the potential range of the California clapper rail occurs in suitable habitats west of the western edge of Sherman Island. California clapper rails are found within a range of salt and brackish marshes. Typical habitat consists of dense pickleweed (*Salicornia*) and cordgrass (*Spartina foliosa*)-dominated saline tidal marshes (Zucca 1954, Harvey 1980). There is also reported use of *Scirpus/Typha*-dominated brackish marshes in the North Bay (Petaluma Marsh, Napa-Sonoma Marshes, Suisun Marsh) (USFWS 1998). Suitability of habitat may also be dependent on other factors, such as

patch size, tidal connectivity (diked marshes), and proximity to other land uses. However, there is insufficient data on these issues relative to their effects on potential occupancy particularly with respect to determining minimum requirements, and thus potential habitat for the California clapper rail is not further restricted in this model on the basis of these factors.

A.9.8 Recovery Goals

The Salt Marsh Harvest Mouse and California Clapper Rail Recovery Plan was finalized in 1984. It is considered outdated and is under revision by the USFWS. Both species will be covered under the Tidal Marsh Ecosystem Recovery Plan.

The CALFED Bay-Delta Ecosystem Restoration Program Plan's Multi-Species Conservation Strategy (MSCS) designates the California clapper rail as "Contribute to Recovery" (CALFED Bay-Delta Program 2000). This means that CALFED will undertake actions under its control and within its scope that are necessary to recover the species. Recovery is equivalent to the requirements of delisting a species under federal and State ESAs.

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